



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
CHEMICAL SAFETY AND  
POLLUTION PREVENTION

**MEMORANDUM:**

**To:** Bo Davis, MS, PM04

**From:** Rebecca Whalen, Ph.D., Entomologist *Rebecca Whalen*

**Secondary Review:** Jennifer Saunders, PhD, Senior Biologist *JS*

**Date:** 1/5/2017

**Subject:** PRODUCT PERFORMANCE DATA EVALUATION RECORD (DER)

**THIS DER DOES NOT CONTAIN CONFIDENTIAL BUSINESS INFORMATION**

**Note:** MRIDs found to be **unacceptable** to support label claims should be removed from the data matrix.

**DP barcode:** 390015

**Decision no.:** Rereg

**Submission no:** Rereg

**Action code:** Rereg

**Product Name:** Bonide Wasp & Hornet Spray

**EPA Reg. No or File Symbol:** 4-392

**Formulation Type:** Aerosol spray

**Ingredients statement from the label with PC codes included:**

Tetramethrin	0.10%	PC: 069003
Permethrin	0.25%	PC: 109701
Piperonyl butoxide	0.50%	PC: 067501, 867501

**Application rate(s) of product and each active ingredient (lbs. or gallons/1000 square feet or per acre as appropriate; and g/m<sup>2</sup> or mg/cm<sup>2</sup> or mg/kg body weight as appropriate):** Indoors: For cluster flies, house flies, mosquitoes, gnats, wasps, hornets, bees, black flies, skipper flies and blow flies, close all doors and windows and spray upward with a slow sweeping motion, 5-10 seconds average. For termites and carpenter ants, inject 5-10 second spray into tunnels and cavities. For lice and lice eggs, spray from a distance of 8-10 inches at a rate of 3 seconds/ft. For fleas, hold can 36" from floor and spray at a rate of 10 seconds/100 ft<sup>2</sup>. For house flies, mosquitoes, gnats, wasps, hornets and bees in animal quarters, close windows and spray at a rate of 2 seconds/1,000 ft<sup>3</sup>. To treat livestock for stable flies, horse flies, deer flies, face flies, house flies, horn flies, mosquitoes and gnats, spray about 3 seconds on each side. Spray on face and head but do not spray into eyes. Outdoors: To kill wasps, hornets, yellowjackets and carpenter bees, spray for 1-2 seconds under eaves, screens and window frames. Spray around outside of house up to a maximum of 3 feet. Spray nests until thoroughly saturated to kill the entire nest population.

**Use Patterns:** Indoors: For cockroaches, waterbugs, palmetto bugs, scorpions, spiders and centipedes, spray into hiding places. For ants, spray trails, nests and points of entry. Spray on ants. For bedbugs, spray mattresses and take bed apart and spray all joints. For fleas and ticks, infested upholstered furniture and mattress may be treated. To control fleas, ticks and lice on dogs, spray parted fur in short bursts. Dampen the fur back to the tail. To treat livestock for blood sucking lice apply to the infested areas of the animal. Outdoors: For flies, mosquitoes, gnats, hornets, wasps and yellowjackets, spray bushes or grass from 4-6 feet away. For ants, cockroaches and centipedes, hold can 203 feet from surface and spray infested area. Spray ant hills.

**I. Action Requested:** Reregistration efficacy review requested. MRIDs 44874708, 42506101, 43958901, 44783503, 44858204, 44874701, 44874702, 44874703, 44874706, 44941301, 51869, 162927, 44874705, 44858202, 44910901, 45399201, 45399202, 45025904 and 42904501 are listed on the data matrix for this product.

**II. Background:** Product specific data were called in for tetramethrin to support the reregistration of this product.

### III. MRID Summary

#### **MRID 44874708. Residual Performance of Deltamethrin SC RTU vs. Commercial Products against House Flies.**

(1) non-GLP

(2) **Methods:** This study assessed the residual efficacy against house flies of seven different insecticide treatments including a 0.25% permethrin product and an untreated control treatment. There were three replicates with an unknown number of flies in each replicate. One gram of product was applied to ceramic (121 cm<sup>2</sup>) or concrete surfaces (153.9 cm<sup>2</sup>). Concrete and ceramic tiles were aged for five months in the laboratory, and then an unknown number of house flies were held on the surfaces under a petri dish for one minute. After one minute, house flies were placed in a clean container and knockdown was recorded at 30 and 60 minutes post exposure and mortality was recorded at 24 hours post exposure. The study states “controls were kept.”

(3) **Results:** Mortality of house flies exposed to ceramic tiles treated with the 0.25% permethrin product was 100% and on concrete tiles was 17%. After 30 seconds there was 96% knockdown of house flies on ceramic and 8% knockdown on concrete. No mortality was observed in the control treatment.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392. This study does not support efficacy claims against house flies because the number of house flies per replicate is unknown and the number of flies used in controls is unknown. A balanced study design is preferred, with at least 5 replicates of ten individuals each tested for both the treatments and the controls. Additionally, efficacy did not reach 90% on concrete tiles.

#### **MRID 42506101. Residual efficacy of Exp. No. FEQ 23 against immature Lone star ticks and immature blacklegged ticks**

(1) non-GLP

(2) **Methods:** The study design consisted of four replicates of five individuals per replicate. There was one control replicate consisting of five individuals. Field-collected immature Lone star ticks were tested separately from field-collected immature blacklegged ticks. Several formulations were tested that are not relevant to the product label: FEN25 (0.1% tetramethrin, 0.25% permethrin), FEN26 (0.2% tetramethrin, 0.5% permethrin), FEN89 (0.1% pyrethrins, 0.2% permethrin, 0.5% piperonyl butoxide), FEN106 (0.2% pyrethrins, 0.4% permethrin, 1.0% piperonyl butoxide), FEQ3 (0.1% tetramethrin, 0.25% permethrin, 0.5% piperonyl butoxide), FEP59 (0.1% pyrethrins, 0.2% permethrin, 0.5% piperonyl butoxide), FEP61 (0.2% pyrethrins, 0.4% permethrin, 1.0% piperonyl butoxide), FEQ5 (0.2% tetramethrin, 0.5% permethrin, 1.0% piperonyl butoxide), FEQ4 (0.15% tetramethrin, 0.375% permethrin, 0.375% piperonyl butoxide), FEP60 (0.15% pyrethrins, 0.3% permethrin, 1.0% piperonyl butoxide) and FEN104 (0.2% tetramethrin, 0.2% permethrin, 1.0% piperonyl butoxide). Formulation Exp. No. FEQ 23, contained 0.1% tetramethrin, 0.25% permethrin and 0.5% piperonyl butoxide. For each replicate, fifteen drops of FEQ 23 were pipetted onto a small filter paper. Filter paper was dried overnight and placed in 20ml vials. Seven days later ticks were added to the vials. Percent mortality was calculated after 24 hrs.

(3) **Results:** Both blacklegged ticks and Lone star ticks showed 100% mortality after 24 hrs. Control mortality was 0%

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because individuals were not removed to untreated containers and were therefore exposed to treatment for 24 hrs, which is unrealistic in a real world scenario; insects should be removed to untreated containers no more than 4-hrs post-exposure. Additionally, the study design should have an equal number of treated and untreated replicates and tests should consist of five replicates of ten individuals unless otherwise justified.

**MRID 43958901. Efficacy of FEQ3 against German cockroaches, American cockroaches and residual efficacy of FEQ3 against German cockroaches, cat fleas, immature Lone star ticks, immature deer ticks and carpenter ants**

a. Direct spray against German cockroaches and American cockroaches

(1) non-GLP

(2) **Methods:** The study design consisted of either: ten replicates of 10 cockroaches each (German cockroaches) or three replicates with five cockroaches each (American cockroaches). No controls were described. Several formulations were tested. Formulation FEQ3 was water-based and contained 0.1% tetramethrin, 0.25% permethrin and 0.5% piperonyl butoxide. Formulation FEQ23 was solvent based and contained 0.1% tetramethrin, 0.25% permethrin and 0.5% piperonyl butoxide. For German cockroaches, 0.5 g or 1.0 g of formulation was sprayed at a distance of 18" into steel container holding cockroaches. For American cockroaches, 1.0 g of formulation was used. Cockroaches were immediately transferred to clean jars and evaluated for knockdown and 24-hr mortality.

(3) **Results:** The 0.5 g treatment of FEQ3 had 90% knockdown of German cockroaches after 189 seconds and 100% mortality after 24 hours. The 1.0g treatment of FEQ3 had 90% knockdown of German cockroaches after 356 seconds and 100% mortality after 24 hours. The 0.5 g treatment of FEQ23 had 90% knockdown of German cockroaches after 177 seconds and 100% mortality after 24 hours. The 1.0g treatment of FEQ23 had 90% knockdown of German cockroaches after 110 seconds and 100% mortality after 24 hours. The 1.0 g treatment of FEQ3 had 90% knockdown of American cockroaches after 336 seconds and 100% mortality after 24 hrs. The 1.0 g treatment of FEQ23 had 90% knockdown of American cockroaches after 59 seconds and 100% mortality after 24 hrs.

(4) **Conclusions:** This study is **unacceptable** because no controls were used. Tests should typically consist of five treated replicates of ten individuals with an equal number of treated and untreated replicates.

b. Residual efficacy against German cockroaches, fleas, blacklegged ticks, Lone star ticks and carpenter ants

(1) non-GLP

(2) **Methods:**

- German cockroaches:
  - The study design consisted three replicates with an unknown number of individuals and one control replicate. Insects were exposed to ceramic tiles treated with FEQ23 (solvent-based, 0.1% tetramethrin, 0.25% permethrin and 0.5% piperonyl butoxide) at 1.0 g/25 inches<sup>2</sup>. Insects were exposed to tile one day and one, two, four, six, eight and twelve weeks after treatment. After a 30-minute exposure cockroaches were moved to a clean container and evaluated for knockdown and 24-hr mortality.
- Fleas:
  - The study design consisted of three replicates with ten adult fleas per replicate. Treatment consisted of 0.05 g (2.88 g/ft<sup>2</sup>) of FEQ3 (water-based, 0.1% tetramethrin, 0.25% permethrin and 0.5% piperonyl butoxide) or FEQ23 applied to carpet plugs. Fleas were added to carpet plugs immediately or after three days and evaluated for knockdown and 24-hr mortality. No controls were described.
- Carpenter ants:
  - The study design consisted of three replicates with five ants per replicate. Pint glass jars were

treated with 0.5 grams of FEQ3 or FEQ23 and allowed to dry overnight. Ants were added to jars and evaluated for knockdown and 24-hr mortality. No controls were described.

- Blacklegged ticks and Lone star ticks:
  - The study design consisted of one replicate with five blacklegged ticks or one replicate with five Lone star ticks. A piece of filter paper was wet with an unknown amount of FEQ3 or FEQ23, allowed to dry and placed in a vial. After seven days ticks were added to the vial and evaluated for 24-hr mortality. No controls were described.

**(3) Results:**

- German cockroaches:
  - At an application rate of 1.0 g spray/25 inches<sup>2</sup>, FEQ23 treatment applied to ceramic tile that was aged for:
    - one day produced 90% knockdown after 18 minutes, 23 seconds
    - one week produced 90% knockdown after 9 minutes, 20 seconds
    - two weeks produced 90% knockdown after 9 minutes, 44 seconds
    - four weeks produced 90% knockdown after 13 minutes, 33 seconds
    - six weeks produced 90% knockdown after 13 minutes, 40 seconds
    - eight weeks produced 90% knockdown after 7 minutes, 58 seconds
    - twelve weeks produced 90% knockdown after 8 minutes, 32 seconds
  - All treated tiles resulted in 100% mortality 24 hours after a 30-minute exposure
  - No control results were reported
- Fleas: When fleas were immediately exposed to treatment FEQ3, applied at a rate of 2.88 g spray/ft<sup>2</sup> to carpet plugs, 100% knockdown resulted after six minutes, 18 seconds. Fleas that were applied to carpet plugs that had been aged for three days after treatment FEQ3 had 100% knockdown after 63 minutes, 11 seconds and 100% mortality after 24 hrs. When fleas were immediately exposed to treatment FEQ23, applied at a rate of 2.88 g/ft<sup>2</sup> to carpet plugs, 100% knockdown resulted after one minute, 11 seconds. Fleas that were applied to carpet plugs that had been aged for three days after treatment FEQ23 had 100% knockdown after 42 minutes, 57 seconds and 100% mortality after 24 hrs. No control results were reported.
- Carpenter ants: No data provided. The study states: “Rapid rates of knockdown were obtained from all formulations tested...high levels to complete knockdown was generally obtained in one minute or less, with all providing complete kill.”
- Blacklegged ticks and Lone star ticks: No data provided. The study states: “All formulations gave 100% mortality after 24 hours.”

**(4) Conclusion:** These studies are unacceptable because control results were not reported. Tests should typically consist of five treated replicates of ten individuals with an equal number of treated and untreated replicates.

**MRID 43958901.** This study is **unacceptable** and should be removed from the data matrix for 4-392. Controls were either not used or controls results were not reported. Tests should typically consist of five treated replicates of ten individuals with an equal number of treated and untreated replicates. Fleas, carpenter ants and ticks were not removed to clean containers after treatment and were therefore exposed to treatment for 24 hrs, which is an unrealistic scenario.

**MRID 44783503. Evaluation of the Efficacy of Saga WP, Suspend SC, Intercept H&G, DeltaDust and Delta G Against the Striped Tailed Scorpion *Vejovis spinigerus*.**

**(1) non-GLP**

**(2) Methods:** Four scorpions were placed in 14.5” x 8” x 5” containers and sprayed with 0.015% permethrin at 1 gal/1000 ft<sup>2</sup>. Each treatment was replicated five times and it is unknown if scorpions were transferred from treated containers. Mortality of scorpions was assessed at 2, 4, 8, and 24 h post application. A control treatment was not included in the study.

**(3) Results:** All treatments killed 100% of scorpions within 4 hours of application.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392 to support efficacy claims against scorpions because a control treatment was not included in the study.

**MRID 44858204. Residual activities of pyrethroid formulations against field-collected *Ixodes scapularis* and *Amblyomma americanum*.**

(1) non-GLP

(2) **Methods:** The study design consisted of three or four replicates with 10 individuals per replicate. The study used a mix of field-collected blacklegged ticks and Lone star ticks. The formulation tested consisted of 0.25% permethrin. One gram of treatment was sprayed onto a 6" x 6" piece of tile, which was dried for four hours. Ticks were placed on the tile and covered with a petri dish. Mortality was recorded at 30 minutes, one hour and 24 hrs. No controls were described.

(3) **Results:** Treatment produced 100% knockdown of ticks after 30 minutes and 100% mortality after 24 hrs. Controls were listed in the results section as having 0% knockdown after 30 minutes and one hour and 0% mortality after 24 hrs.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392. Ticks were not removed to untreated containers and were therefore exposed to treatment for 24 hrs, which is unrealistic in a real world scenario; insects should be removed to untreated containers no more than 4-hrs post-exposure. Also, a balanced study design is preferred, with at least 5 replicates of ten individuals each tested for both the treatments and the controls. Additionally, the number of blacklegged or Lone star ticks per replicate was not described, only the total number of both species combined was reported.

**MRID 44874701. Residual Evaluation of Water-Based Insecticides for the Control of German Cockroaches.**

(1) non-GLP

(2) **Methods:** The study design consisted of four replicates with 10 German cockroach males per replicate. Several formulations were tested, including one treatment consisting of 0.25% permethrin. Treatment was applied to 3.5" x 3.5" glass plates at a rate of 1 gal./1,000<sup>2</sup> and left to dry. Residual efficacy was tested on plates treated one day, seven days, 30 days, 10 weeks and 14 weeks previously. Cockroaches were placed on treated plates for one minute then removed to an untreated surface to determine knockdown time and 24 hr mortality. No controls were described.

(3) **Results:** Exposure of German cockroaches to the 0.25% permethrin treated glass plates resulted in greater than 90% knockdown between 46 minutes and 1 hour after exposure for all evaluation dates except the 10 week point where knockdown only reached 87.5% at 60 minutes. The 0.25% rate of permethrin killed greater than 90% of German cockroaches at 24 h post exposure on all dates except the 7 day evaluation when mortality was only 80%.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because no controls were used in the experiment.

**MRID 44874702. Comparison of Deltamethrin RTU, Vikor RTU, InterCept, Empire 20, Ford's Dursban, Saga WP, Suspend SC and DeltaDust in Efficacy Tests and Residual Activity in Carpenter Ant Control.**

(1) non-GLP

(2) **Methods:** This study tested an unknown rate of a 0.25% dilution of permethrin applied to vinyl tile and concrete block for residual efficacy against carpenter ants. Efficacy was evaluated at 1, 2, 4, 8, 12, and 16 weeks post application. There was no control treatment used in the study.

(3) **Results:** Exposure of carpenter ants to the vinyl tiles resulted in greater than 90% efficacy through 12 weeks post

application, and 87% mortality at 16 weeks post application. Mortality of ants exposed to concrete blocks treated with permethrin was only greater than 90% at 1 week post application.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because a control treatment was not included in the study, and because the rate of product application is unknown and cannot be compared to the label.

**MRID 44874703. Evaluation of Residual Treatments of Deltamethrin RTU, Ford's Dursban, Empire 20, InterCept, Saga WP, Suspend SC, Vikor 26% and Vikor RTU on Concrete and Floor Tiles for the Control of Pharaoh Ants, Fire Ants and Crazy Ants.**

(1) non-GLP

(2) **Methods:** The study design consisted of five replicates with 10 ants of each species per replicate. Pharaoh ants, fire ants, and crazy ants were exposed for an unknown period of time to vinyl floor tiles (5" x 5") and 15 cm diameter concrete plates that were treated with 0.25% formulation of permethrin at a rate of 1 gal/1000 ft<sup>2</sup>. Residual evaluations were conducted at 1, 7, 30, 60, and 90 days. No control treatment was included in the study.

(3) **Results:** For pharaoh ants, the 0.25% permethrin formulation had 99% mortality after seven days, 86% mortality after one month and 42% mortality after two months on vinyl tiles; and 70% mortality after seven days, 89% mortality after one month, 57% mortality after two months and 91% mortality after three months on concrete. For fire ants, the 0.25% permethrin formulation had 100% mortality after seven days, 97% mortality after one month, 73% mortality after two months and 100% mortality after three months on vinyl tiles; and 100% mortality after seven days, 77% mortality after one month, and 4% mortality after two months on concrete. For crazy ants, the 0.25% permethrin formulation had 100% efficacy after seven days and one month, 96% mortality after two months, and 100% mortality after three months on vinyl tiles; and 100% mortality after seven days; 49% mortality after one month, and 31% mortality after two months on concrete.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392 to support efficacy claims against pharaoh ants, fire ants, and crazy ants because a control treatment was not included in the study, and exposure times were not given.

**MRID 44874705. Direct Spray Performance of Deltamethrin SC RTU Formulations Against German Cockroaches, Carpenter Ant, and Crickets.**

(1) non-GLP

(2) **Methods:** This study assessed the efficacy of a direct application against German cockroaches and carpenter ants of seven different insecticide treatments including a 0.25% permethrin RTU product and an untreated control treatment. Each replicate was sprayed with 1 g of product/replicate of unknown size. Each treatment was replicated three times, with 10 individuals for German cockroaches and 5 individuals for carpenter ants. Immediately after treatment, cockroaches and ants were transferred to clean containers. Knockdown was assessed every 2 minutes for the first 15 minutes and then every five minutes thereafter until all individuals were knocked down. Mortality was assessed at 24 hrs post treatment.

(3) **Results:** Mortality of German cockroaches and ants treated with 0.25% permethrin was 100% at 24 hrs post application. The KT<sub>90</sub> for cockroaches was 17.8 minutes and for ants was 2.6 minutes. No control mortality was observed for either species.

(4) **Conclusion:** This study is **partially acceptable**. This study supports claims of kills German cockroaches for a direct spray type of application of permethrin. This study does not, by itself, support claims against carpenter ants because the number of individuals per replication was not adequate. In addition, this study does not support claims for surface applications because the application rate cannot be calculated and compared to the label rate for the proposed product. This study does not support knockdown claims, because data were not provided before 10 minutes post application.



**MRID 44874706. Direct Spray Performance of Deltamethrin SC RTU Formulations against German Cockroaches, Carpenter Ant, and Crickets**

(1) **Conclusion: Extraneous Submission.** The study in the MRID is the same study as in MRID 44874705, therefore this MRID was not reviewed.

**MRID 44941301. Laboratory performance of TetraPerm Q3 WBA as a direct spray against termites and carpenter ants**

(1) non-GLP

(2) **Methods:** The study design was five replicates with ten individuals per replicate (*Reticulitermes flavipes*) or five replicates with five individuals per replicate (*Camponotus ferrugineus*). The formulation tested consisted of 0.10% tetramethrin, 0.25% permethrin and 0.50% piperonyl butoxide. Insects were placed in a metal cylinder with a screen on the bottom and were directly sprayed with one gram of aerosol. Insects were immediately transferred to a clean petri dish. Knockdown time was recorded every 30 seconds and mortality was determined after 24 hrs.

(3) **Results:** Treatment produced 90% knockdown of termites after 30 seconds and 100% mortality after 24 hrs. Treatment produced 90% knockdown of carpenter ants after two minutes and 100% mortality after 24 hrs. Controls had 0% mortality after 24 hrs.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because the number of individuals in the control was not disclosed. Additionally, to have a carpenter ant claim either Black carpenter ant, Western carpenter ant or Florida carpenter ant should be tested. Carpenter ant replication was also insufficient since the study design should consist of at least 5 replicates of ten individuals each tested for both the treatments and the controls.

**MRID 51869. Efficacy of Pramex 0.25% aqueous pressurized spray against house flies and cockroaches**

(1) non-GLP

(2) **Methods:** There is no Materials and Methods section. Tables with results state that 0.25% Pramex formulation was tested using ten replicates with an unknown number of individuals per replicate. An average dose of 3 g/1000 ft<sup>3</sup> treatment was applied to houseflies; an average dose of 10 g treatment in an unknown area was applied to cockroaches.

(3) **Results:** For houseflies, treatment produced 81.6% knockdown after 15 minutes and 81% mortality after 24 hrs. For cockroaches, treatment produced 68.5% knockdown after four hours, 78.5% mortality after 24 hrs; and 81% mortality after 48 hrs.

(4) **Conclusions:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because the active ingredients in the tested formulation were not given, there were no controls, the species of cockroach tested was not disclosed, and the number of insects per replicate was not given. Also the type of container the insects were tested in was not specified and insects were not moved to a clean container post-treatment.

**MRID 162927. Permethrin residual data**

(1) non-GLP

(2) **Methods:** Data for bed bugs, mosquitoes, face flies, horn flies and stable flies were included in this study but these pests are not on the product label so data will not be reviewed. Two tests for Lone star tick efficacy were included. In the first test, data for Lone star ticks were reported on page 30, but no study methodology was included so the data will not be reviewed. The second test is described below. There is fire ant data on page 44 but there is no mention of replication or study design so the data will not be reviewed. There is residual data for German

cockroaches, American cockroaches, Oriental cockroaches and brownbanded cockroaches listed on page 35 but it is not reported here because there is no accompanying study methodology.

Black flies:

- (1) *Simulium* spp.: Treatment consisted of permethrin (1 mg a.i./kg) applied as a total body spray on steers. This use pattern is not relevant to the product label use pattern. Results will not be listed.
- (1) *Aleurocanthus woglumi*: Treatment consisted of an application of permethrin (0.25 or 0.50 lb a.i./100 gal. water) applied to citrus blackflies applied on an unknown number of potted citrus plants.
- (2) *Aleurocanthus woglumi*: Treatment consisted of an application of permethrin (0.25 or 0.50 lb a.i./100 gal. water) applied to citrus blackflies applied on an unknown number of dooryard Citrus spp.
- (2) *Simulium* spp.: Treatment consisted of 1, 2, 4 and 6 mg ai/kg applied to steers. This use pattern is not relevant to the product label use pattern. Results will not be listed.

Brown dog tick:

- Study investigates the efficacy of an unknown insecticide against brown dog ticks on dogs. The treatment methodology, insecticide formulation and study design are not described. Therefore the data will not be reviewed.

Chiggers:

- Treatment consisted of 2.3, 1.1 or 0.6 kg permethrin/ha applied to plots, which were not described. Chiggers (*Eutrombicula alfreddugesi*) were counted pre-treatment, then one day and one, two, three and four weeks after application.

German cockroaches:

- The study design consisted of two blocks of three replicates per wood surface with an unknown number of individuals per replicate. A treatment of 11.6% Transparent Emulsion Concentrate was applied to plain plywood and shellacked plywood at a rate of either 10 mg ai/ft<sup>2</sup> or 20 mg ai/ft<sup>2</sup>. Surfaces were aged for 445 days.

Fleas:

- Study investigates the efficacy of an unknown insecticide against cat fleas on dogs. The insecticide treatment is not described so the data will not be reviewed here.

House flies:

- (1) The study design is not given. The treatment is permethrin, 0.5 g/ai (stet).
- (2) The study design is not given. The rate of permethrin application is not given. Results will not be listed due to a lack of study design.

Lone star ticks:

- The study design consisted of 45 fenced-in plots of tick-infested oak-hickory habitat. There were 15 control plots. Formulations of permethrin (0.12 and 0.38 kg/liter) were applied at 47-77 liters/ha with an air sprayer. Ticks were sampled both before and after treatment by placing dry ice in the center of a cloth panel and counting ticks on the top of the cloth after 1 hr. Four sites were sampled per plot weekly for 2-3 weeks pre-treatment, daily for 1-2 days posttreatment, then weekly through six weeks post-treatment.

Ticks:

- *Dermacentor variabilis*: Study design not given. The treatment is varying levels of Permethrin applied to golden retriever to control *Dermacentor variabilis*. The insecticide treatment is not described so the data will not be reviewed here.

### (3) Results:

Black flies:

- (1) *Aleurocanthus woglumi*: Both rates of permethrin resulted in 100% mortality after one week.
- (2) *Aleurocanthus woglumi*: Permethrin applied at a rate of 0.25 lb ai/100 gal. resulted in 75% mortality after four weeks. Permethrin applied at a rate of 0.50 lb ai/100 gal. resulted in 87% mortality after four weeks.

Chiggers:

- Average four-wk efficacy was approximately 63% for the rate of 2.3 kg permethrin/ha, 57% for 1.1 kg permethrin/ha and 42% for 0.6 kg permethrin/ha.

German cockroaches:

- In the first block of experiments, treatment applied to plain hardwood at 10 mg ai/ft<sup>2</sup> and 20 mg ai/ft<sup>2</sup>



resulted in 97% mortality and 100% mortality, respectively. Treatment applied to shellacked plywood at 10 mg ai/ft<sup>2</sup> and 20 mg ai/ft<sup>2</sup> resulted in 97 % mortality and less than 70% mortality, respectively. In the second block of experiments, treatment applied to plain hardwood at 10 mg ai/ft<sup>2</sup> and 20 mg ai/ft<sup>2</sup> resulted in 100% mortality and 100% mortality, respectively. Treatment applied to shellacked plywood at 10 mg ai/ft<sup>2</sup> and 20 mg ai/ft<sup>2</sup> resulted in 97 % mortality and 97% mortality, respectively.

House flies:

- Treatment applied at an unknown rate to plywood showed “relatively constant” mortality for 50 days. Treatment applied at an unknown rate to enamel were toxic to house flies in the initial portion of the test.

Lone star ticks:

- Treatment with 0.07, 0.21 and 0.55 kg ai/ha all resulted in 100% mortality 48 hrs post-treatment.

(4) **Conclusions:** This study is **unacceptable** and should be removed from the data matrix for 4-392. For black flies, replication wasn’t described and application method wasn’t described. For chiggers, the insects were not moved to clean containers after treatment application, the treatment methodology description was missing, and efficacy testing of *Trombicula alfreddugesi* is required for chigger claims. For German cockroaches, the number of individuals per replicate was not specified. For house flies, no study design was described, no application details were given and insects not moved to clean containers. For the *Dermacentor variabilis* ticks, brown dog ticks, and fleas, no information was given about the insecticide formulation tested. For lone star ticks the formulations of permethrin were applied as a liquid using an air sprayer. The defined use pattern for 4-392 is as an aerosol. Because the use patterns are different, study data may not be bridged to support label claims for 4-392.

#### **MRID 44858202. Evaluation of SBA/DTM TetraPerm and PyraPerm WBA against German Cockroaches and Cat Fleas**

(1) non-GLP

(2) **Methods:** This study tested a water-based aerosol products containing 0.1% tetramethrin, 0.25% permethrin and 0.50% piperonyl butoxide, in addition to several other products containing different active ingredients. There was no untreated control treatment. The products were applied directly to German cockroaches and cat fleas at a rate of 1 g per replicate of unknown area. For both species, each treatment was replicated three times with 10 individuals per replicate.

(3) **Results:** The treatment produced 90% knockdown of German cockroaches after 6 minutes and 100% mortality after 24 hrs. The treatment produced 90% knockdown of cat fleas after 3.6 minutes and 100% mortality after 24 hrs.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because there was no control treatment.

#### **MRID 44910901. Evaluation of the efficacy of 5 pyrethroid formulations against the striped tailed scorpion, *Vejovis spinigerus*, in the laboratory**

(1) non-GLP

(2) **Methods:** Formulation tested was Intercept H&G, 13.3% permethrin, diluted to 0.015% a.i. or 0.008 mg a.i./m<sup>2</sup>. The study design consisted of five treatment replicates and three control replicates with four scorpions per replicate. Treatment was applied using an air sprayer at an unknown height above treatment containers. Mortality was assessed at two, four, eight, 24 and 48 hrs, with mortality defined as “inability to crawl or move appendages in a deliberate manner.”

(3) **Results:** Treatment resulted in 100% mortality after 2 hrs. Controls had 0% mortality.

(4) **Conclusions:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because the study combined moribund individuals with dead individuals to calculate mortality. Additionally, for scorpion claims the striped bark scorpion should be tested.

## MRID 45399201. TetraPerm Wasp & Hornet Field Evaluations Efficacy Data

(1) non-GLP

(2) **Methods:** The AgrEvo TetraPerm FEQ 23 W&H (0.1% Tetramethrin +0.25% Permethrin +0.5% Piperonyl Butoxide, EPA Reg No. 432-776= Vikor Wasp, Hornet & Yellowjacket Killer) formulation was compared to competitive products containing 0.2% Tetramethrin + 0.125% Phenothrin and 0.254% Resmethrin formulations. Each product was sprayed directly on foraging and flying yellowjackets (*Vespula* sp.) and knockdown time was evaluated. The FEQ23 formula was additionally tested on paper wasps (*Polistes* spp.), aerial yellowjackets (*Dolichovespula* sp.), baldfaced hornets (*Dolichovespula maculata*), European hornets (*Vespa crabro*) and bumble bees (*Bombus* sp.), carpenter bees (*Xylocopa* spp.) and horntails (*Sirex* sp.) by directly spraying individuals or nests sprayed directly. No control was indicated.

(3) **Results:** The study qualitatively reported that TetraPerm FEQ 23 W&H direct spray resulted in “immediate knockdown” of all yellowjacket workers hit by spray. The degree of control for their ground or aerial nests was based on whether the nest/entrance was exposed to direct spray. While treatment of *Dolichovespula* nests in the wall/roof voids were not “completely controlled” by direct sprays into the entrance hold to nest, they did reduce activity one-day post-treatment; the study author also noted that treatment of exposed aerial nests under eaves resulted in complete worker kill with ground nests having similar results.

Knockdown of the paperwasp queen and workers was reported to be immediate with mortality of sprayed wasps within 24 hours (percent mortality was not given). In treated (*Polistes*) nests, which were accessible to the direct sprays, no activity was evident after 24-72 hours post-treatment (note that “activity” was not defined).

Direct spray of baldfaced hornets in knockdown at approximately 0.5 seconds. Workers inside the nest either dropped to the ground or flew away, depending on whether they were contacted by the spray. Returning workers were repelled (i.e. would touch but not enter the treated nests). At twelve hours post-treatment, numerous dead hornets were found on the ground under the nest and clogging the nest opening; no live workers were found.

Knockdown of European hornet workers, carpenter bees, bumblebees, and horntails was also immediate; nest control was described for European hornets, carpenter bees in wood, and bumblebees in soil, likely because the nests could be sprayed directly.

Materials containing resmethrin or phenothrin were not reviewed because they did not match the active ingredients of subject product #40208-7.

(4) **Conclusions:** MRID 45399201 is **unacceptable**, should be removed from the data matrix for 4-392, and does not support the use of this product on yellowjackets, paperwasps, European hornets, baldfaced hornets, carpenter bees, bumblebees and horntail wasps for the following reasons:

In all eight studies, no controls were used for any of the species listed. The protocol did not indicate a number of individuals per replicate and the raw data were not provided. It is recommended that at least 5 replicates of 10 individuals per replicate are tested, and that a control is included with the same number of individuals and replicates. While mortality was recorded (but not explicitly reported) for paper wasps and bald faced hornets, mortality was not recorded for European hornets, yellowjackets, carpenter bees, bumblebees or horntail wasps. Any kills on contact or knockdown claims against stinging hymenoptera should show efficacy within 10 seconds post application for all species listed, followed by confirmation of greater than 90% mortality no later than 96 hours post-treatment. Nest control/nest activity was reported qualitatively (e.g. “yes” or “no activity”) but the performance standards used to rate nest control/activity was not indicated and therefore the validity of the data cannot be determined.

## MRID 45399202. Performance of TetraPerm Wasp and Hornet FEQ 23 Aerosol vs. Baygon Wasp and Hornet Aerosol against Yellowjackets

(1) non-GLP

(2) **Methods:** Vikor Wasp & Hornet spray (Tetramer FEQ23) (0.10% Tetramethrin, 0.25% Permethrin, 0.50% Piperonyl Butoxide; EPA # 432-776) was compared to Sprayon Wasp and Hornet Killer II (0.5% Baygon, 0.052% Pyrethrins, 0.262% PB; EPA# 10900-73). Efficacy was only reviewed for Vikor Wasp & Hornet spray because the AIs in Sprayon Wasp and Hornet Killer II are different from the subject product. The physical evaluation (distance and pressure test) will not be described in detail here but indicated that the 12 ounce cans could be sprayed 20 feet while the 15 ounce cans could be sprayed 15-17 feet.

Tuna flavored cat food was placed in Petri dishes as bait near a yellowjacket nest. Several yellowjackets attracted to the bait were directly sprayed at a distance of 12 inches for 2-3 seconds. This was replicated 3 times for each product. Knockdown was observed for each spray, and mortality was evaluated at 24 hours. No control was indicated.

(3) **Results:** Yellowjackets that were sprayed were immediately incapable of flight and within a few seconds were not moving. Mortality was reported to be 100% at 24 hours for all wasps.

(4) **Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392. Controls were not used, the number of individuals per replicate was not described and only three replicates per treatment were used. It is recommended that at least five replicates of 10 individuals per replicate are tested with an equal number of control replicates.

#### **MRID 45025904. Efficacy of a total release aerosol against German cockroaches and adult cat fleas**

(1) GLP

(2) **Methods:** German cockroaches and cat fleas were exposed for two hours to aerosol fogger Chemsico Insecticide NT in a 6,000 ft<sup>3</sup> room.

(3) **Conclusions:** This study is **unacceptable** and should be removed from the data matrix for 4-392 because the chemical formulation of the treatment used was not disclosed and therefore the tested product cannot be compared to the product label. Additionally, the tested product was an aerosol fogger, which cannot be compared to the product label use as an aerosol spray.

#### **MRID 42904501. Performance of Pyreperm and Tetramer Waterbased Total Release Aerosol Formulations in Laboratory and Field Studies**

(1) non-GLP

(2) **Methods:**

a. German cockroaches, American cockroaches, cat fleas, house flies, carpenter ants

Study design consisted of placing several jars of insects (described below) in a room and discharging a total release aerosol formulation (one block). Each formulation was repeated 3-4 times. Each block consisted of the following:

German cockroaches: 10 adult males

American cockroaches: 5 adult males

Cat fleas: Approximately 50 adults, mixed sex

House flies: Approximately 300 adults, mixed sex

Carpenter ants: 5 workers

Formulations tested include the following:

FEQ4 (0.15% tetramethrin, 0.375% permethrin, 0.375% piperonyl butoxide), FEQ5 (0.2% tetramethrin, 0.5% permethrin, 1.0% piperonyl butoxide), FEP59 (0.1% pyrethrin, 0.2% permethrin, 0.5% piperonyl butoxide), FEP60 (0.15% pyrethrin, 0.3% permethrin, 1.0% piperonyl butoxide), FEP61 (0.2% pyrethrin, 0.4% permethrin, 1.0% piperonyl butoxide), FEN104 (0.2% tetramethrin, 0.2% permethrin, 1.0% piperonyl butoxide)

Aerosols (1 oz. can) of each formulation was placed in the center of a 1,000 ft<sup>3</sup> room and discharged. After two hours the room was ventilated. Knockdown for each species was rated, and mortality was rated after 24 and 48 hours. Cockroaches and carpenter ants were contained in glass jars, cat fleas were contained in a 5-gallon plastic

bucket and house flies were released into the room. No controls are described.

b. Deer ticks and lone star ticks

Study design consisted of four replicates with five ticks in each replicate. Ticks were placed in vials containing filter paper treated with the formulation and dried for a week. No description of how the paper was treated or at what rate. No controls were described. Mortality was evaluated after 24 hrs.

c. Field testing

Field testing was done with formulations containing AIs either not included on the label or at concentrations higher than listed on the label so this data will not be reviewed.

**(3) Results:**

a. German cockroaches, American cockroaches, cat fleas, house flies, carpenter ants

Only the results of formulations containing tetramethrin, permethrin and piperonyl butoxide will be discussed.

Percent mortality after 48 hours was as follows:

German cockroaches: FEQ4: 99.6%; FEQ5: 100%; FEN104: 100%

American cockroaches: FEQ4: 100%; FEQ5: 100%; FEN104: 100%

Cat fleas: FEQ4: 93.7%; FEQ5: 90.0%; FEN104: 67.2%

House flies: FEQ4: 98.8%; FEQ5: 98.7%; FEN104: 98.1%

b. Deer ticks and lone star ticks

Only the results of formulations containing tetramethrin, permethrin and piperonyl butoxide will be discussed.

Percent mortality after 24 hours was as follows:

Deer ticks: FEQ4: 100%; FEQ5: 100%; FEN104: 100%

Lone star ticks: FEQ4: 100%; FEQ5: 100%; FEN104: 100%

Controls are reported as having 0% mortality.

**(4) Conclusion:** This study is **unacceptable** and should be removed from the data matrix for 4-392. There were either no controls used or the number of controls was not disclosed and arthropods were not removed to untreated containers and were therefore exposed to treatment for 24 or 48 hrs, which is unrealistic in a real world scenario; insects should be removed to untreated containers no more than 4-hrs post-exposure. Also, all tested formulations had a higher concentration of tetramethrin than what is on the labeled product. Additionally, the tested product was a total release aerosol fogger, which cannot be compared to the product label use as an aerosol spray.

#### **IV. EXECUTIVE DATA SUMMARY:**

The submitted data will support claims of kills German cockroaches for direct spray only.

#### **V. LABEL RECOMMENDATIONS:**

(1) Make the following changes in the Directions for Use:

- Delete directions for use against cluster flies, house flies, mosquitoes, gnats, wasps, hornets, bees, black flies, blow flies, water bugs, palmetto bugs, scorpions, spiders, centipedes, termites, carpenter ants, bedbugs, lice, fleas, ticks, stable flies, horse flies, deer flies, face flies, horn flies, mites and yellowjackets (ant and spider DFU can remain if ants are qualified by “except fire, harvester, pharaoh, and carpenter ants” and spiders are qualified by “except black widow and brown recluse spiders.”)
- Qualify all cockroach claims with “German cockroaches” and modify the cockroach DFU to indicate that the cockroaches should be directly contacted by the product (i.e. residual DFU are not supported by efficacy data)

(2) The following marketing claims are acceptable:

Any claims against non-public health pests; note that all general claims (e.g. “Kills Pantry Pests, Flying and Crawling Insects”) should be modified to specify listed bugs (“Kills listed pantry pests, flying and crawling insects”).

(3) The following marketing claims are unacceptable:

- All marketing claims related to cluster flies, house flies, mosquitoes, gnats, wasps, hornets, bees, black flies, blow flies, water bugs, palmetto bugs, scorpions, spiders, centipedes, termites, carpenter ants,

bedbugs, lice, fleas, ticks, stable flies, horse flies, deer flies, face flies, horn flies, mites and yellowjackets (note that ant and spider marketing claims may be retained if they are modified to include the species exclusions as described above)

- “Kills Fast”
- “Quick Kill”
- “Kills Wasps & Hornets on Contact”
- “Kills with Residual Action as Wasps & Hornets Return to Nest”
- “Kills the Entire Nest”
- “Kills Nest and Insects with Residual Action”
- “Kills Wasps, Hornets & Yellow Jackets – Triple Action”
- “Drops Wasps, Hornets & Yellow Jackets Instantly”
- “Gives Knockdown & Kill of Wasps, Hornets & Yellow Jackets”
- “Can be Used Indoors (Attics and Other Places Where Nests are Built) and Outdoors on Wasp & Hornet Nests”
- “Instant Knockdown”
- “Prevents Nesting”
- “Kills Exposed Termites, Exposed Carpenter Ants, and Listed Wood Destroying Insects”
- “Triple Action Instant Knockdown Formula”

(4) The following MRIDs should be removed from the data matrix, as they are classified as “extraneous” or “unacceptable” to support the product: MRIDs: 44874708, 42506101, 43958901, 44783503, 44858204, 44874701, 44874702, 44874703, 44874706, 44941301, 51869, 162927, 44858202, 44910901, 45399201, 45399202, 45025904 and 42904501